

ABSTRACT

5           Stable suspensions of a biologically active protein are disclosed that  
are suited for aerosol delivery to the lungs of a patient in need of treatment,  
which comprise particles of biologically active protein suspended in ethanol.  
In a preferred embodiment, the invention describes a stable suspension of  
insulin useful for aerosol delivery to the lungs of a patient in need of treatment  
10 comprising particles of a pharmaceutically effective amount of insulin  
suspended in ethanol. A method of delivering a therapeutically effective  
amount of a protein to the respiratory tract of a patient is described which  
comprises producing an aerosol of a stable liquid suspension of a protein  
using an electrohydrodynamic spraying means wherein the liquid suspension  
15 comprises particles of the protein suspended in ethanol. The stable ethanol  
suspensions of the invention may optionally contain up to about 20% (V/V) of  
a pharmaceutically acceptable formulation additive such as glycerol,  
propylene glycol and polyethylene glycol as well as minor amounts (from  
about 0.05% to about 5.0% W/V) of a pharmaceutically acceptable excipient.

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